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Notes on New Jersey violets*

HOMER DOLIVER HOUSE

(WITH PLATES 16–18)

During the spring and early summer of 1904, I was able to make a collection and field study of the violets in the vicinity of New Brunswick, Middlesex County, New Jersey. Several of the species collected have not been previously reported from the state, and this, in connection with the fact that two of them have recently been described as new from Long Island,† and that many of the specimens collected are undoubted hybrids, lends particular interest to the violets of this region.

Among the acaulescent species, the following are either new to the state or deserving of special mention.

Viola Stoneana sp. nov. "*Viola septemloba* LeConte," Stone, Proc. Acad. Phila. **1903**: 678. *pl. 35. f. 2; pl. 39. f. 3.* 1903. Not *V. septemloba* LeConte, Ann. N. Y. Lyc. **2**: 141. 1828. Not "*V. septemloba* Le Conte," Brainerd, Rhodora **6**: 16. 1904.

This species, so well described and figured by Mr. Stone, can in no way be connected with LeConte's species of Georgia, Florida and Alabama. The latter is well described by Mr. Pollard ‡ in Small's recent *Flora*, and specimens from that region match well with LeConte's description and his unpublished plate, which I have been able to examine through the courtesy of Dr. E. L. Greene.

V. Stoneana is related to *V. palmata*, having about the same floral characters. The leaves, however, have a characteristic lobation and except for the ciliated margins are nearly glabrous. The capsules from the cleistogamous flowers are suberect on peduncles 5–6 cm. high. The accompanying illustration (PLATE

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† E. P. Bicknell, in Torreya 4: 129. 1904.

‡ J. K. Small, Flora of the Southeastern United States 891. 1903.

16) was made from fresh flowering plants collected near Milltown (*no. 47*).

The type of *Viola Stoneana* is Witmer Stone's *no. 5113*, collected near Kennett Square, Pa., May 7, 1903. *No. 5112*, a flowering specimen, is identical (National Herbarium numbers, *490405* and *490404*.

Material in the National Herbarium shows the range of this species to extend as far south as Virginia.

VIOLA PALMATA L. Sp. Pl. 933. 1753.

The typical form of this species, if we regard the figure and description of Britton and Brown's *Illustrated Flora*,* as typical; is rare in this region. The following varieties are more abundant than the species.

VIOLA PALMATA VARIABILIS (Greene) Stone, Proc. Acad. Phila. **1903**: 667. 1903. *V. variabilis* Greene, Pittonia **5**: 91. 1902.

Recognizable by the diversified character of lobation exhibited by the leaves and the very dense pubescence. Abundant on dry or sandy slopes and in open woods, near New Brunswick (*nos. 34, 35 and 36*). One of these with variegated flowers is the *Viola palmata variegata* G. Don.†

VIOLA PALMATA ANGELLAE (Pollard) Stone, Proc. Acad. Phila. **1903**: 678. 1903. *V. Angellae* Pollard, Torreya **2**: 24. 1902.

Found only on the hills north of Bound Brook (*no. 32*), and therefore considerably south of the Orange mountains, the type locality. The flowers are much larger and of a brighter blue than the typical *V. palmata.* Like *V. palmata*, it has various "*dilatata*" forms, and if recognized as a species, it must be upon its floral characters, which are more evident in the field than in the herbarium.

All of the subspecies of *V. palmata*, and its allies, often show forms with more or less entire or three-lobed leaves, and this in itself is the best proof of the impropriety of using "*dilatata*" as a subspecific or varietal name. The condition expressed is merely a "form," and often not even that. The species or subspecies designated by Elliott * as *V. palmata dilatata*, is probably distinct from the more northern so-called var. *dilatata*.

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* Britton and Brown, Illustrated Flora **2**: 446. 1897. *f. 2484*.

† Gen. Syst. **1**: 321. 1831.

Viola Brittoniana × cucullata hyb. nov.

Glabrous, light-green, 1.5–2 dm. tall ; mature leaves triangular or triangular-ovate in outline, shallowly cordate or nearly truncate, divided into 5–9 somewhat irregular lobes, the lobes cut one-half to two-thirds of the distance to the petiole, the margins irregularly crenate-dentate ; petioles two to three times as long as the blades ; flowers similar to *V. cucullata*, the petals somewhat narrower ; cleistogamous flowers and capsules also similar to *V. cucullata*, but the peduncles shorter.

This is apparently the same as the plant mentioned by Mr. Witmer Stone † as a possible hybrid between *V. Brittoniana* and *V. cucullata*. Its characters and habitat seem to favor such an assumption. The cleistogamous capsules are usually more or less abortive when mature and the petaliferous flowers apparently never develop capsules bearing seeds, which is the case with both *V. Brittoniana* and *V. cucullata*. The accompanying illustration (PLATE 17) was made from living plants collected near Milltown (*no. 62*, June 5, 1904, type in herb. House; and *no. 79*, June 14, 1904) and growing in close proximity to both *V. Brittoniana* and *V. cucullata*. *Viola notabilis* Bicknell,‡ described from Long Island, should also be referred to this hybrid.

VIOLA PECTINATA Bicknell, Torreya **4** : 129. 1904.

Found near Dayton, Middlesex County, in low meadows and along ditches (*no. 15*, May 10 ; *no. 57*, May 30, 1904). Apparently an excellent species, and notable in being discovered both on Long Island and New Jersey at about the same time. The withered petioles of former seasons are more or less persistent, the basal auricles of the sepals are short and blunt and not at all suggestive of either *V. Brittoniana* or *V. emarginata*, to which the species is apparently related. The cleistogamous flowers are sagittate, on erect peduncles 5–7 cm. long ; their oblong capsules about 1 cm. long. (PLATE 18.)

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* Bot. S. C. and Ga. 1 : 300. 1817.

† Proc. Acad. Phila. 1903 : 680. 1903.

‡ Torreya 4 : 131. 1904.

VIOLA NEPETAEFOLIA Greene, Pittonia **5**: 92. 1902.

A peculiar little species with elongated, deeply cordate and very narrow leaves. Found near Dayton (*no. 22*, May 10, 1904). Related to *V. affinis* LeConte, from which it differs in its leaf-characters and the densely pubescent capsules of the cleistogamous flowers.

VIOLA CONJUGENS Greene, Pittonia **4** : 3. 1899.

Found in two localities near New Brunswick and Milltown (*nos. 25 and 40*). In both instances, growing with a form of *V. fimbriatula* (*no. 24*) the leaves of which approach *V. sagittata* in shape, yet are densely pubescent. *V. conjugens* differs from it by its oblong-ovate and cordate leaves, less pubescence, and its larger flowers of a deeper violet-blue color. It is possibly a hybrid.

VIOLA FIMBRIATULA J. E. Smith, in Rees Cyclop. No. 38. 1817.
V. ovata Nutt. (1818.)

The most abundant violet of the region and also the most variable. It shows all gradations into *Viola fimbriatula aberrans* Stone,* and a close study of this variety in the field leads me to agree with Mr. Brainerd † in calling it a natural hybrid. It in turn seems to pass into *V. Porteriana* Pollard, ‡ excellent specimens of which occur at Lindenau, near New Brunswick (*nos. 54 and 67*) and, in the field, also show all indications of being true hybrids.

V. fimbriatula is subject to such great variation that it will be a matter of great difficulty properly to express, in terms of species, the several hybrids which result from the crossing of the numerous potent forms of *V. fimbriatula*, and *V. sagittata*, with other and more constant species. My own observations upon the violets of this region convince me that such species as *V. fimbriatula*, *V. sagittata*, *V. palmata*, *V. cucullata*, *V. emarginata*, and *V. Brittoniana*, do produce seeds from the petaliferous flowers, which are capable of germination and growth, and much as I was loath to admit the fact, I was convinced that not only a few, but that numerous hybrids exist between these species and others.

VIOLA SAGITTATA Ait. Hort. Kew. **3**: 287. 1789.

In its typical form (*nos. 60 and 61*) this species is nearly or

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*Proc. Acad. Phila. **1903**: 683. *pl. 37. f. 4, 6.* 1903.

† Rhodora **6** : 218. 1904.

‡ Bull. Torrey Club **24** : 404. 1897.

quite glabrous, but forms occur, and usually more abundantly, which are more or less ciliate or even pubescent and it is often difficult to determine whether the specimens under consideration should be referred to *V. sagittata*, to *V. fimbriatula*, or to some hybrid form.

The key to the species and varieties of violets of New Jersey given below contains 33 species and varieties, of which 29 occur in Middlesex County, and are indicated by a star. Further report of the hybrid forms will be made by President Ezra Brainerd of Middlebury College, to whom they have been referred.

KEY TO THE SPECIES OF NEW JERSEY VIOLETS.

I. Acaulescent; flowers scapose.

A. Plants stoloniferous.
Corolla purple; introduced, fragrant species. *1. *V. odorata.*
Corolla white or yellow.
Corolla yellow; leaves orbicular. 2. *V. rotundifolia.*
Corolla white.
Cleistogenes deflexed; leaf-blades from broadly ovate to orbicular.
Upper and lateral petals twice as long as broad; petioles not spotted. *3. *V. blanda.*
Upper and lateral petals thrice as long as broad; petioles red-spotted. *4. *V. LeConteana.*
Cleistogenes erect; leaf-blades from narrowly oval to linear.
Leaf-blades from lanceolate to linear-lanceolate. *5. *V. lanceolata.*
Leaf-blades oval or ovate-oblong. *6. *V. primulaefolia.*
B. Plants not stoloniferous.
Cleistogamous flowers wanting; petals beardless; leaves divided.
Upper petals purple, lower blue. 7. *V. pedata.*
Upper and lower petals of the same color. *8. *V. pedata lineariloba.*
Cleistogenes usually present; lateral and often the lower petals bearded.
Cleistogamous flowers deflexed, horizontal or on short spreading peduncles.
Plant glabrous or nearly so.
Leaf-blades attenuate; petioles glabrous; petals light-blue.
Leaf-blades but little longer than broad. *9. *V. affinis.*

Leaf-blades twice as long as broad, deeply cordate. * 10. *V. nepetaefolia*

Leaf-blades acute, deeply cordate; petioles pubescent; petals deep purple-blue, the upper ones reflexed. * 11. *V. papilionacea.*

Plant pubescent or hirsute.

Leaves entire.

Plant less than 1 dm. high; leaves spreading, hirsute above, glabrous beneath. * 12. *V. villosa.*

Plant more than 1 dm. high; leaves erect, softly pubescent throughout. * 14. *V. palmata variabilis.*

Leaves lobed.

Lobes extending about to center of the blade, or blades deeply 3-lobed. * 13. *V. palmata.*

Lobes extending nearly or quite to the base of the blade, lobes more than 3.

Corolla deep purple-blue, early leaves entire. * 14. *V. palmata variabilis*

Corolla light-blue; early leaves lobed. * 15. *V. palmata Angellae.*

Cleistogenes erect or ascending on long peduncles.

Leaves lobed or divided.

Sepals with short blunt auricles at base; leaves ciliate; cleistogenes on peduncles 5–6 cm. long. * 16. *V. Stoneana.*

Sepals long-auricled at base; plants glabrous; cleistogenes on peduncles 10–15 cm. long.

Lobes extending nearly to base of blade, the 5–9 lobes linear-lanceolate, the middle lobe 3-divided. * 17. *V. Brittoniana.*

Lobes irregular, extending to or somewhat beyond the middle of blade. * 18. *V. Brittoniana* × *cucullata.*

Leaves entire; crenate or dentate, or incised at the base, not deeply lobed.

Leaf-blades cordate-ovate or cordate-oblong in outline.

Plant glabrous; leaf-blades cucullate, broadly ovate-cordate, sinuate-dentate. * 19. *V. cucullata.*

Leaf-blades pubescent; crenate-dentate.

Leaf-blades oblong-ovate, blunt, shallowly cordate. *20. *V. conjugens.*

Leaf-blades ovate, deeply cordate, acute. *22. *V. fimbriatula aberrans.*

Leaf-blades not cordate-ovate or cordate-oblong in outline.

Leaf-blades ovate-sagittate or oblong-lanceolate and sagittate.

Plant densely pubescent or villous; petioles usually shorter than the blades. *21. *V. fimbriatula.*

Plant glabrous or ciliate; petioles usually longer than the blades. *23. *V. sagittata.*

Leaf-blades triangular in outline, dentate or incised at the base.

Plant sparingly pubescent; leaf-blades longer than broad, usually dentate at base. *24. *V. Porteriana.*

Plant glabrous; leaf-blades mostly broader than long.

Auricles of the sepals very long; blades dentate or incised at the base. *25. *V. emarginata.*

Auricles of the sepals short and blunt; leaf-blades conspicuously pectinate. *26. *V. pectinata.*

II. Caulescent; leafy-stemmed.

A. Corolla yellow; leaf-blades ovate-reniform, entire.

Plant pubescent; root-leaves usually wanting. *27. *V. pubescens.*

Plant glabrate; root-leaves usually present. *28. *V. scabriuscula.*

B. Corolla purple, white or cream-colored.

Stipules entire; petals white or tinged with purple. 29. *V. canadensis.*

Stipules incised or pinnatifid.

Perennial; stipules much smaller than the leaf-blades.

Petals cream-colored, the lower ones purple-veined. 30. *V. striata.*

Petals blue or purple, rarely white.
Spur shorter than the petals. *31. *V. labradorica.*
Spur longer than the petals. *32. *V. rostrata.*
Annual; stipules nearly as large as the blades. *33. *V. Rafinesquii.*

Sets of the violets collected in Middlesex County have been placed in the herbaria of the New York Botanical Garden and the National Museum, and in the private herbaria of Mr. Witmer Stone and President Ezra Brainerd. The first, and therefore most complete set, is retained in the writer's own herbarium.

UNITED STATES NATIONAL MUSEUM.

Explanation of plates 16-18

PLATE 16

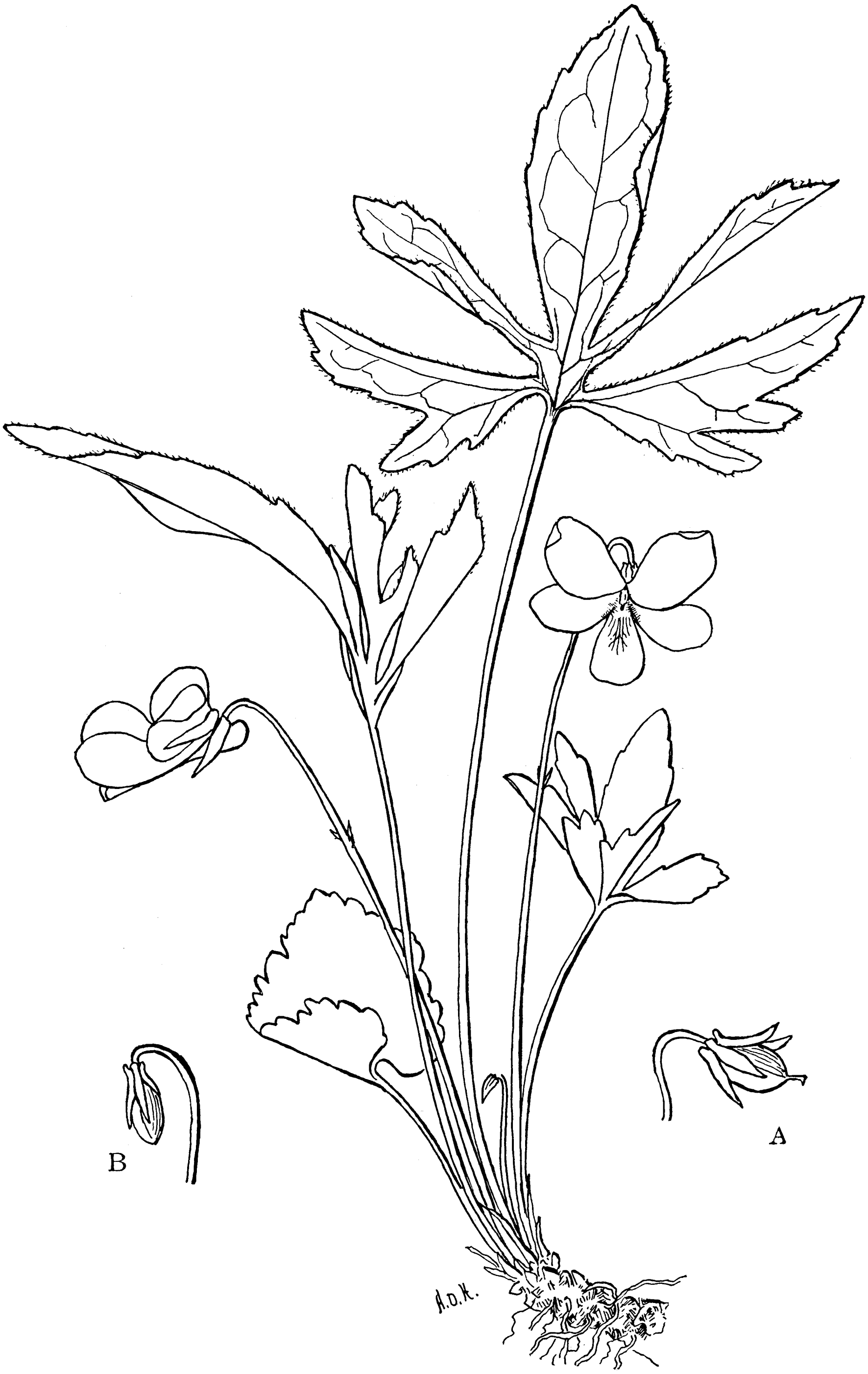
Viola Stoneana House, natural size. *A*, flower capsule. *B*, cleistogamous capsule.

PLATE 17

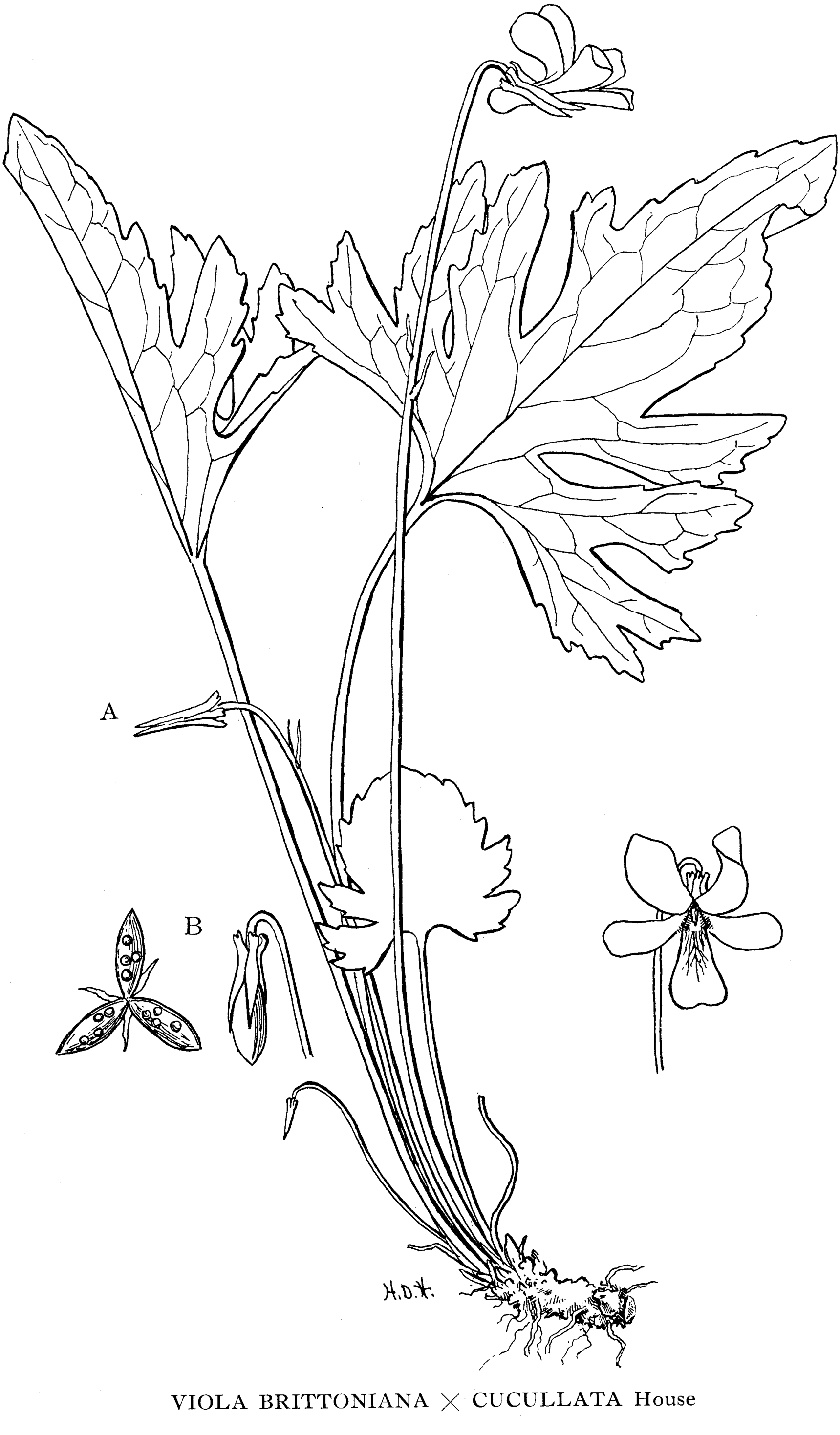
Viola Brittoniana × *cucullata* House, natural size. *A*, cleistogamous flower. *B*, cleistogamous capsule.

PLATE 18

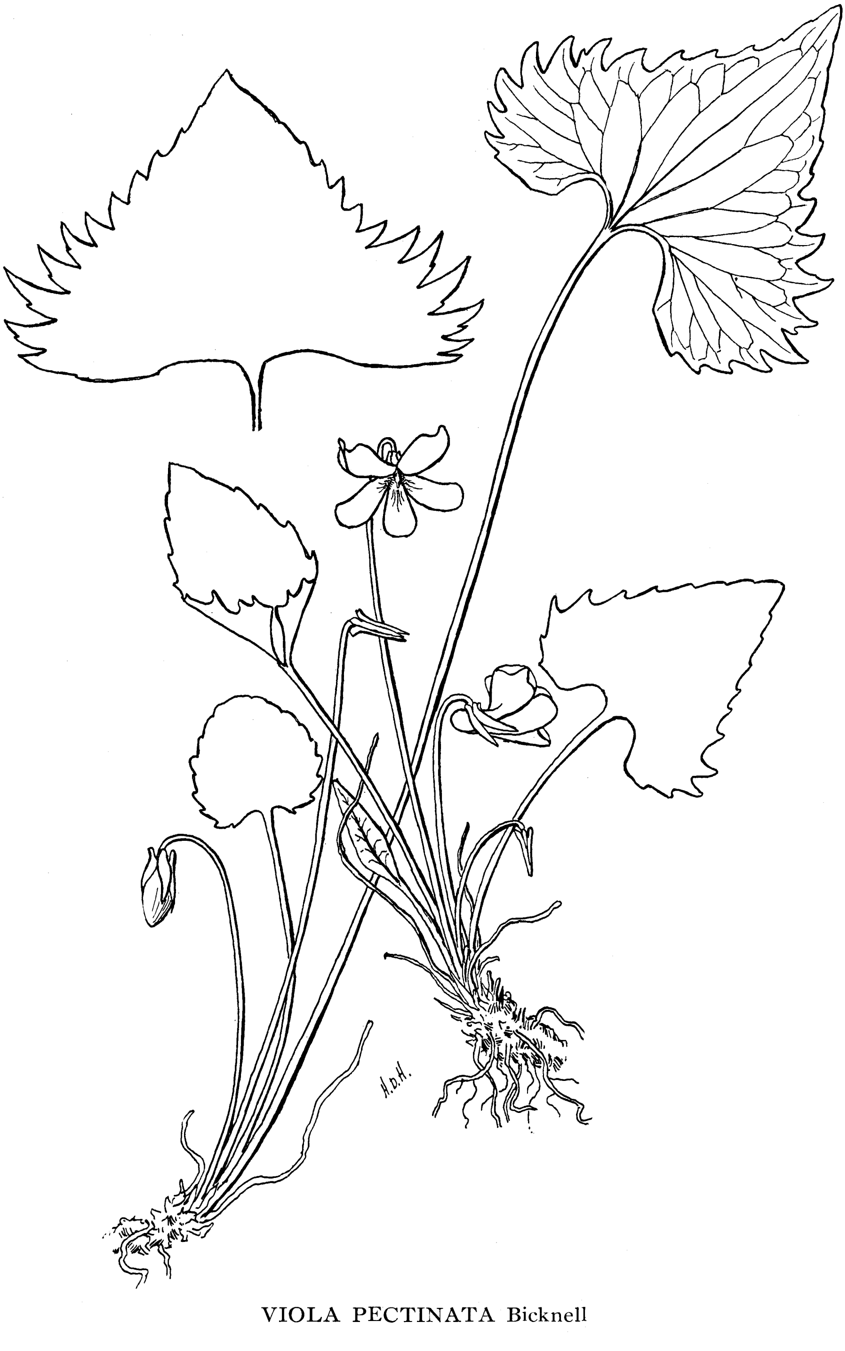
Vioia pectinata Bicknell, natural size.



VIOLA STONEANA House



VIOLA BRITTONIANA × CUCULLATA House



VIOLA PECTINATA Bicknell